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POLLUTION-CAUSED FISH KILLS IN 1964

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE • Public Health Service

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Public Health Service Publication No. 847 (Revised)
(1964 Edition)

Foreword

In 1964, the Public Health Service received 485 official reports of fish kills occurring in various fresh and marine waters of the United States. This was by far the largest number of reports ever received and the number of fish killed was also the largest, an estimated 18,387,000.

Industrial pollution in 193 incidents accounted for the largest number (12,715,000) of the fish killed. Municipal wastes (4,100,000 fish) and toxic substances from agricultural operations (1,522,000) followed in second and third places. Out of the 485 separate kills, 15 were major disasters, involving more than 100,000 fish each.

Although the 1964 kill totals were larger than ever before reported, it is highly unlikely they represent more than a sampling of the kills which actually occurred. Part of this is due to the differing reporting procedures followed by the various States and part to the obvious difficulties involved in monitoring this country's thousands of miles of fish streams and millions of acres of lakes and marine waters.

The Public Health Service began its annual census of fish kills in 1960, working in cooperation with the State fish and game agencies, with leading conservation organizations and with the U.S. Fish and Wildlife Service. Fish kills are doubly significant in water pollution control; the fish themselves are, of course, a unique and valuable recreation and economic resource, while the occurrence of a kill very often signals a hazard affecting other users of water and endangering public health.

One caveat is necessary for those who would relate fish kills to the well-being of a fishery. A kill occurs because of some sudden and deadly change in the aquatic environment; if given sufficient time, the stream may be expected to recover and the fish population return. Water pollution exerts its greatest toll on a fishery, not by causing individual kills but by destroying habitat. Serious fish kills seldom occur in badly polluted water because there are usually few or no fish in the stream to die.

How Fish Kills Are Reported

The key to successful reporting of fish kills is the individual sportsman, the interested citizen, or the local citizen who first recognizes that a kill has occurred and who informs his local game warden or health department. Only when a State fish and game agency or water pollution control agency learns of a kill promptly can it investigate it and learn enough about it to develop an adequate history of what has happened.

The reporting form used by the Public Health Service in transmitting information from the State agency to the Federal Government is shown on p. 28 of this report. The form asks the State agency to identify and locate the kill, to estimate the number and variety of the fish, and to report on the cause of the kill.

Many factors influence a State's reported totals. In some States, extensive efforts are made to collect all fish-kill statistics; in others, data are gathered only when there is a legal prosecution. In 1964, 10 States reported no kills at all; 2 of these, Delaware and Alaska, have never reported any fish kill.

The Pennsylvania State Fish Commission has carried on a noteworthy and effective campaign to enlist the help of fishermen and others in reporting kills. It distributes a wallet-sized pamphlet entitled "How to Improve Your Fishing by Reporting Fish Kills" and encourages the fisherman to carry it with his license. The leaflet explains how to obtain a water sample when dead fish are encountered and includes a gummed label so that the sample may be identified as to time, place, and other pertinent factors. As a result of this citizen education, Pennsylvania's reports in 1964 were more complete and greater in number than those of any other State.

Quotes from Field Reports

Remarks volunteered by the State fishery biologists, wardens, and other investigators reflect the impact of the kill on the eye witness and are very helpful in identifying sources of pollution and action to correct it. As in past years, some of these reports are printed here, exactly as received by the Public Health Service.

A PLATING TANK containing cyanide was drained and flushed into the sewer at the truck plant. All fish, including trout up to 28 inches, eels, snakes, and bottom life were killed from point of discharge. When warden arrived on scene a number of people were taking the dead and dying fish and were quickly warned to leave them alone.

PARK SWIMMING POOL was drained. Rapid drainage of the chemically treated water caused a quick rise and minor flood at several small dams in the creek. Water had a greenish color while fish were turning up in trouble and dying.

WATER APPEARED DARK brown in damage area near the tannery and there was scum on the stream bottom. Kill appears to have been complete (1,500 fish) in this trout-stocked section of the river. Tannery superintendent was out of town.

A SHEEP-DIP TRUCK had filled its tanks at the bridge where dead fish were observed.

ACCIDENTAL SPILL of a tank of muriatic acid entered storm system from plant driveway. Plant treatment engineer immediately dumped 14 50-lb. bags of lime into manhole downstream to counteract. All fish and bottom life killed.

ACID MINE DRAINAGE gave the water a bluish cast. Bottom of stream cloudy with white flakes. All aquatic life, including several hundred fish, killed in a 3-mile stretch of the creek.

FISH KILL OCCURRED on grounds of the Army depot where a house foundation was sprayed with dieldrin for termites. A heavy shower the same day washed the dieldrin into the trout-stocked streams.

THE WATER COMPANY applied copper sulfate to reservoir; overflow went into the brook.

A LARGE NUMBER OF industrial wastes discharge from plants using acids, chromes, and cyanides, draining into storm sewers and into the bay. Water is slate color, foamy, and shore where dead fish washed up appeared blue. Bottom heavily silted with dark sediments like that of fly ash.

A GASOLINE TRACTOR-TRAILER had a damaged compartment that was leaking. Driver emptied contents alongside Route 13. It sickened and smothered fish and aquatic life, furbearing animals, including moles, muskrats, and raccoons.

STRIP MINE PUMPINGS of 2,500 gallons per hour go directly into creek all day. Stream was milky, grayish; rocks and bottom covered with fine claylike deposit. Water was stocked with trout just prior to the kill. Fish had been dying here for 2 weeks.

INDUSTRIAL WASTES got into the creek from the Federal penitentiary outlet. Stream was clear in damage zone with bottom dark green in spots. Water cloudy above damage zone. Due to low flow, it took the pollution 4 days to take effect on the stream.

OPERATOR OF A backhoe struck an 8-inch pipeline, causing small leak which was under high pressure, allowing 50–60 gallons of gasoline to enter Warrior Run. Damage repaired in a few hours, cooperation excellent; 3,253 dead fish.

THE FOUNDRY denied responsibility but finally opened up several pits and found leaky fuel lines and the underground completely saturated with oil. Only a few fish were killed but warden received numerous calls from fishermen unable to eat their trout catches because of strong oil taste.

WHEN FIELDS ARE WET this cheese factory cannot spread its whey, so dumps it in any convenient place. This time it ran from a hog lot into a field tile, then into the stream. Water chalky, stones coated with a black septic substance, and there was a stench in the whole area.

THE CEMENT COMPANY repeatedly and continuously drains its tanks of wet cement grindings to the stream. High pH readings recorded at time of investigation indicated that an unusually heavy run of high alkaline wastes, burning with caustic action, had passed through, killing 1,500 fish, other aquatic organisms and crayfish. The fish bore burned or bloody patches. Witnesses reported fish were trying to jump out of water, swim ashore, and doing many odd gyrations as they expired.

DISCHARGE CAME from a knitting mill, killing snakes and aquatic life in a stream stocked with trout. Stream flows through a farm raising race horses and concern was expressed for the horses.

POTATO FARM WORKER washed about one gallon of settlings from an endrin spray can into a farm pond which drains through a swamp into the creek. After the kill of 14,580 fish was traced to this farm, the owner used a bulldozer to stop the flow, then pumped the pond water on to a field.

AN ESTIMATED 80,000 gallons of crude oil and butane were accidentally spilled from a pipeline during construction of a Bureau of Reclamation dam. Coffer dams were installed and tanker trucks siphoned the trapped oil. The affected streambed was burned to remove residual oils. Studies are in progress to determine the time needed for recovery of plant and animal life.

FIFTY THOUSAND FISH were killed when ammonia lost from a refrigeration system passed through the municipal sewage plant and discharged to the river.

THE P—— club cleaned its waterlines with a 900-gallon solution of muriatic and acetic acid. They had rusting and leaking water valves. Insect life as well as 6,000 fish were killed. Stream appeared normal otherwise.

A CROP DUSTING plane sprayed a cotton field adjacent to the upstream limits of the kill, resulting in 1,525 dead fish.

WASTES FROM SLAUGHTERHOUSE, normally treated in the city sewage plant, were bypassed because grease and solids, supposed to have been removed under terms of contract by the packing company, stopped up lines. The river is polluted for 8 miles. Decomposition at time of check made it impossible to determine species or number of dead fish.

RAW SEWAGE discharged into the creek from the State boys school caused an oxygen depletion, killing the fish.

CATTLE SPRAYED with DDVP (1.02 percent) were permitted access to a small fishing pond. When the cattle waded in, 250 fish were killed.

A LARGE ACCUMULATION of organic wastes from a rendering plant was swept downstream by a slight rise in the river. Ten thousand fish, some up to 38 pounds, died in 6 miles of the oxygen-depleted stream.

THE CITY PARK LAKE was sprayed for mosquito control with 40 percent DDT. Five thousand young catfish were killed.

AN AIR-CONDITIONING system was cleaned with muriatic acid solution. Apparently some of the solution remained in one blocked coil system, emptying later to the drain system and to the stream. Several hundred fish, plus frogs, other animal life and plant life were killed for a distance of three-quarters of a mile downstream.

A SLUG OF ZERO OXYGEN water was released from a dam. As it moved downstream an estimated 2,000 fish were killed.

THIS FOOD PROCESSING company cleaned its boilers with a caustic solution which drained into settling ponds and was then flushed into the stream. The company will no doubt be prosecuted.

THE PORK PRODUCTS slaughter shop waste treatment plant has not functioned for some time. Water in damage zone turbid and giving off a rancid odor from decomposing materials. Preliminary check showed zero oxygen in creek where fish were in distress. Five hundred fish killed in a 5-mile stretch of the stream.

THIS RESEARCH AND DEVELOPMENT company was warned 6 months ago to keep all substances out of this stream. On June 7 the warden found a large amount of sludge and oil allowed to flow into the stream. From 1½ feet of sludge was found at point of entry and some was found 6 miles downstream. For 1 mile all aquatic food was destroyed and some damage occurred in the entire 6-mile stretch. All fish moved out.

MANUFACTURER OF COPPER hydrates and oxides deposits sludge here at will, makes no attempt to hold them from draining into the creek. Water had a bluish cast. In addition to the 5,460 fish killed, an estimated 4,284 other life forms—crayfish, frogs, salamanders, earthworms, etc., were killed.

FIFTEEN HUNDRED pounds of thiodan-sulphur were applied to 40 acres of tomatoes, drifting over a dairy ranch pond. Analyses of dead fish showed: crappie 0.01 ppm thiodan; catfish 0.20 ppm thiodan; pasture sample after 7 days .16 ppm thiodan.

POORLY TREATED SEWAGE from the city treatment plant causes low dissolved oxygen and high concentration of ammonia in Salt Fork. This kill of 2,000 fish occurred in 3 miles of the stream below the plant.

WIDESPREAD AERIAL SPRAYING of toxaphene for army worm control in wheat caused many fish kills estimated at 42,600 over the entire county of New Madrid. Spraying was done in windy weather and the sprays were not cut off over ditches and streams.

A MIXTURE OF 245T, diesel oil and water was used to spray weeds along a canal. Instead of the recommended 4 gallons of oil, the applicator used 100 gallons in the solution.

The 1964 Kill Data

Historical Summary. Table 1 presents a comparison of major fish-kill data as obtained by the Public Health Service since the beginning of its reporting activity in 1960. It must be remembered that trends evidenced in this table are more likely to reflect changes in reporting results than changes which may have actually taken place in the number or the severity of the fish kills.

Summary by States. The summary for the 40 States is shown in table 2. Of the 485 notifications, 385 indicated the number of fish killed while the remaining 100 estimated losses in such unquantifiable terms as "thousands," "many hundreds," and even "tons." While these 100 unquantifiable kills are included in the cumulative listing, the numbers column is left blank.

Sources of Pollution. Tables 3 and 4 summarize kills by sources of pollution and by operations subgroup. It will be seen that "combined indu-trial operations" is the largest reported cause of the kills; typical of this category, and as a matter of fact one of the leading causes for 1964, is steel and coke operations. Sewage was the most serious cause of fish deaths arising out of municipal operations and land drainage the most serious arising out of agricultural operations.

Types of Water and Seasonal Incidence. Tables 5, 6, and 7 show the types of water in which fish were killed, and the incidence of kills by month. Over half the kills and two-thirds of the fish killed were reported in the 3-month period July through September.

Severity of Kills. The remaining tables show the severity of kills and their duration. Not shown in tabular form (but which can be seen in the itemized summaries) are the kinds of fish killed, whether forage or game. Roughly 15 percent of the fish found dead were game and the rest were nongame. It is believed that 6-million of the more than 18 million fish killed were of some commercial value.

***Table 1.*—Historical summary of pollution-caused fish kills, June 1960–December 1964**

	June–Dec. 1960	1961	1962	1963	1964
Number of States reporting	36	45	37	38	40
Number of reports	286	411	381	436	485
Reports which stated number of fish killed	149	263	233	300	355
Total estimated number of fish killed	[1] 6, 379, 000	[1] 15, 910, 000	[1] 7, 118, 000	7, 980, 000	18, 387, 000
Average size of kill [2]	2, 925	6, 535	5, 710	7, 775	5, 490
Largest kill reported	5, 000, 000	5, 287, 000	3, 180, 000	2, 000, 000	7, 887, 000
Reports where extent of area affected was stated:					
A. Rivers:					
Number of reports	189	240	259	271	339
Miles of stream	1, 204	1, 686	1, 448	2, 203	1, 440
B. Lakes and reservoirs:					
Number of reports	25	50	25	69	37
Acres affected	1, 697	5, 967	2, 581	5, 644	12, 637
Average duration of kill in days	2. 93	2. 64	2. 59	3. 18	2. 44

[1] After adjustment for reports giving bare or costs reasons.

[2] Excludes reports of 100,000 or more as being estimated errors. This number does not exceed 15 reports in any 1 year.

Table 2.—Pollution-caused fish kill summary by State

	Total number of reports	Reporting number of fish killed		Extent of damage					
		Number of reports	Number of fish	Miles of river		Acres of lake		Miles of shore	
				Number of reports	Miles	Number of reports	Acres	Number of reports	Miles
Alabama	10	8	34,542	6	26				
Arkansas	6			1	2	1	3,000		
California	25	22	2,478,600	12	35	9	483	2	2
Colorado	2	2	1,000	2	14				
Connecticut	4	2	500	1	2	1	10		
Florida	2	1	1,000,000	1	4	1	7,740		
Georgia	7	1	750	4	31	1	5		
Idaho	3	3	4,700	2	10				
Illinois	17	16	291,334	10	64	3	292		
Indiana	15	14	20,750	11	32	1	25		
Iowa	13	10	71,700	3	13				
Kansas	28	28	1,351,140	24	168				
Louisiana	43	41	56,517	33	136	5	22	1	3
Maine	1								
Massachusetts	5	5	7,200	3	13				
Michigan	14	13	24,600	12	19	1	8	1	1
Minnesota	5	3	2,110	4	13				
Missouri	35	32	137,625	25	223	10	16		
Montana	2			1	5				
Nebraska	7	6	17,175	4	9	2	11		
Nevada	2	1	2,000	2	2				
New Hampshire	7			4	13	3	600		
New Jersey	12	10	4,695	7	27	3	4		
New Mexico	1			1	3				
New York	17	15	149,400	15	23	1	1		
North Carolina	5	5	5,795	4	9	1	1		
North Dakota	1	1	62,500						
Ohio	19	18	7,970,266	12	39				
Oregon	6	6	34,350	6	24				
Pennsylvania	75	58	3,050,666	71	215	2	40		

Table 2.—Pollution-caused fish kill summary by State—Continued

	Total number of reports	Reporting number of fish killed		Extent of damage					
		Number of reports	Size list of fish	Miles of river		Acres of lake		Miles of shore	
				Number of reports	Miles	Number of reports	Acres	Number of reports	Miles
Rhode Island	1	1	200						
South Dakota	1	1	5,000	1	5				
Tennessee	11	9	10,414	7	14	3	410		
Texas	43	21	103,600	20	152	7	55	1	5
Utah	1	1	1,000	1	1				
Virginia	11	6	69,720	4	20				
Washington	6	6	124,650	2	17				
West Virginia	5	5	545,218	5	23				
Wisconsin	10	10	17,769	8	26	2	6		
Wyoming	4	3	2,118	3	7			1	1
Total	465	265	17,669,714	239	1,440	57	12,637	6	11

Table 1.—Fish kill summary by source of pollution

Source of pollution	Number of reports	Reporting number of fish killed		Average size of kill[1]	Estimated number of fish killed[2]			Estimated number of recreational value
		Number of reports	Number of fish		Total	Game	Nongame	
Agricultural operations	127	106	1,615,092	4,655	1,522,000	304,000	1,218,000	700,000
Industrial operations	193	153	12,335,301	4,755	12,715,000	1,920,000	10,795,000	2,742,000
Municipal operations	123	97	3,893,687	6,240	4,100,000	369,000	3,731,000	2,534,000
Transportation operations	26	16	22,211	1,235	32,000	8,000	24,000	17,000
Other operations	17	13	13,423	1,030	18,000	4,000	14,000	10,000
Total	465	265	17,669,714	5,490	18,387,000	2,605,000	15,782,000	6,003,000

[1] Average derived after excluding 10 reports of 100,000 or more.
[2] Inclusive all fish killed as reported plus the even-up number killed for each source applied to those reports where no actual number was given.

Table 4.—Summary of fish kills by operations subgroup

Source of pollution	Number of reports	Reporting number of fish	
		Number of reports	Number of fish
Agricultural operations:			
Insecticides, poisons, etc	93	74	191, 167
Fertilizers	5	4	67, 040
Manure-silage drainage	29	26	1, 156, 885
Subtotal	127	104	1, 415, 092
Industrial operations:			
Mining	20	13	2, 575, 247
Food and kindred products	41	33	249, 556
Paper and allied products	9	8	8, 604
Chemicals	26	23	525 739
Petroleum	26	14	5[illegible], 286
Metals	28	26	195, 478
Combinations	12	12	8, 336, 060
Other	31	24	87, 331
Subtotal	193	153	12, 525, 301
Municipal operations:			
Sewerage systems	96	74	3, 668, 226
Refuse disposal	1	1	2, 345
Municipal operations—Continued			
Water systems	10	10	127, 796
Power	5	4	3, 825
Other	10	8	91, 495
Subtotal	122	97	3, 893, 687
Transportation operations:			
Rail	5	5	6, 475
Truck	10	8	10, 733
Barge or boat	1	1	250
Pipeline	10	4	4, 753
Subtotal	26	18	22, 211
Other operations	17	13	13, 423
Total	485	385	17, 869, 714

Table 5.—Fish kill summary by type of water body

Type of water body	Total number of reports	Reporting number of fish killed		Extent of damage					
		Number of reports	Number of fish	Miles of river		Acres of lake		Miles of shore	
				Number of reports	Miles	Number of reports	Acres	Number of reports	Miles
River	405	320	13, 839, 541	339	1, 440				
Lake	67	52	1, 498, 403			48	12, 164	3	4
Bay	13	13	2, 531, 770			9	473	3	7
Total	485	385	17, 869, 714	339	1, 440	57	12, 637	6	11

Table 6.—**Fish kill summary by type of water**

Type of water	Total number of reports	Reporting number of fish killed	
		Number of reports	Number of fish
Fresh	469	370	15, 334, 099
Salt	9	9	2, 531, 700
Brackish	7	6	3, 915
Total	485	385	17, 869, 714

Table 7.—**Fish kill summary by month**

Month	Total number of reports	Reporting number of fish killed	
		Number of reports	Number of fish
January	21	10	91, 739
February	9	9	28, 734
March	12	8	9, 593
April	29	23	78, 879
May	62	48	2, 077, 536
June	74	62	360, 836
July	106	84	10, 422, 305
August	71	56	902, 664
September	50	44	2, 978, 922
October	22	17	721, 517
November	21	16	175, 871
December	8	8	21, 118
Total	485	385	17, 869, 714

Table 8.—**Fish kill summary by severity of kill**

Severity	Number of reports	Reporting number of fish killed		Average size of kill [1]
		Number of reports	Number of fish	
Total kill	67	51	3, 798, 841	10, 230
Heavy kill	187	150	5, 241, 338	8, 790
Moderate kill	121	101	548, 550	1, 835
Light kill	84	64	37, 316	585
Not stated	26	19	8, 243, 669	980
Total	485	385	17, 869, 714	5, 490

[1] Average derived after exclusion of 15 reports of 100,000 or more.

Table 9.—**Distribution of duration by severity of kill**

(*Number of reports showing kills lasting indicated number of days*)

Days	All reports	Total kill	Heavy kill	Moderate kill	Light kill	Not stated
<1	63	5	15	21	21	1
1	120	11	44	34	29	2
2	99	17	43	28	8	3
3	37	8	19	7	3	
4	12	2	6	2	1	1
5	10	1	8	1		
6	5	1	3		1	
7	9	1	4	2	2	
8	1	1				
9						
10	5	1	3	1		
12	1					1
14	3	2	1			
15	1				1	
20	1		1			
21	2		1		1	
31	1		1			
34	1					1
Total	371	50	148	96	67	17
Average	2. 44	2. 87	2. 84	1. 65	1. 86	

Table 10.—**Fish kill summary by degree of severity**

Source of pollution	All reports	Total kill	Heavy kill	Moderate kill	Light kill	Not stated
Agricultural operations	127	12	69	34	11	1
Industrial operations	193	34	59	48	37	15
Municipal operations	122	20	48	25	22	7
Transportation operations	26	1	7	7	10	1
Other	17	------	4	7	4	2
Total	485	67	187	121	84	26
Percent of responses						
Agricultural operations	100.0	9.4	54.3	26.8	8.7	0.8
Industrial operations	100.0	17.6	30.5	24.9	19.2	7.8
Municipal operations	100.0	16.4	39.3	20.5	18.1	5.7
Transportation operations	100.0	3.8	26.9	26.9	38.6	3.8
Other	100.0	------	23.5	41.2	23.5	11.8
Total	100.0	13.8	38.6	24.9	17.3	5.4

Table 11.—**Frequency distribution of reported duration of critical effects**

(*Number of reports showing kills lasting indicated number of days*)

Days	All reports	Agricultural operations	Industrial operations	Municipal operations	Transportation operations	Other operations
<1	63	7	34	17	3	2
1	120	45	30	36	5	4
2	99	33	38	15	8	5
3	37	14	14	8	1	------
4	12	2	5	4	1	------
5	10	4	3	3	------	------
6	5	1	3	1	------	------
7	9	2	6	1	------	------
8	1	------	1	------	------	------
9	------	------	------	------	------	------
10	5	------	1	3	1	------
12	1	------	1	------	------	------
14	3	------	3	------	------	------
15	1	1	------	------	------	------
20	1	------	1	------	------	------
21	2	------	2	------	------	------
31	1	------	1	------	------	------
34	1	------	1	------	------	------
Total	371	109	144	88	19	11
Average	2.44	2.01	3.19	1.79	2.08	1.36

RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL			OPERATIONS INDICATED AS RESPONSIBLE FOR KILL (SEE CODES BELOW)	TYPE OF FISH KILLED		PERCENT OF KILL WHICH WAS OF COMMERCIAL VALUE	ESTIMATED NUMBER OF FISH KILLED	SEVERITY				ESTIMATED MILES OR ACRES AFFECTED	DURATION OF TOXIC EFFECT	
		MONTH	DAY	YEAR		PERCENT GAME	PERCENT FORAGE			TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)		(A)	(B)
ALABAMA																
LAKE MARTIN	ALEXANDER CITY	6	5	64	50	90%	10%	-	300				-	-	-	-
VLLY CR WARRIOR R	CONCORD	12	3	64	31	43%	57%	14%	11,000		2			2M	7	-
HATCHECHUBBEE CR	COTTONTON	10	23	64	28	60%	40%	15%	-		2			7M	-	-
HATCHECHUBBEE CR	COTTONTON	11	20	64	28	65%	35%	15%	6,000		2			7M	21	-
COTTONWOOD CREEK	GALLION	7	13	64	31	30%	70%	70%	-				4	2M	-	-
TOMBIGBEE RIVER	MCINTOSH	6	14	64	24	8%	92%	62%	327			3		6M	-	-
TOMBIGBEE RIVER	MCINTOSH	6	21	64	24	9%	91%	76%	7,985		2			-	-	12
THREE MILE CREEK	MOBILE	6	15	64	31		100%	-	430			3		-	-	6
THREE MILE CREEK	MOBILE	7	8	64	31		100%	-	5,700		2			-	-	6
SPANISH RIVER	MOBILE	6	15	64	26		100%	-	2,800		2			2M	-	-
ARKANSAS																
BAYOU MACON	EUDORA	7	5	64	44	30%	70%	-	-		2			-	-	-
LAKE CHICOT	LAKE VILLAGE	5	15	64	11	20%	80%	-	-				4	3,000A	15	-
LAKE CHICOT	LAKE VILLAGE	8	13	64	11	60%	40%	-	-			3		-	3	-
LAKE JUNE	STAMPS	1	13	64	25	100%		-	-		2			-	-	-
LAKE JONES	STRONG	1	6	64	25	3%	97%	80%	-	1				-	-	-
LIT LAGRUE BAYOU	STUTTGART	11	3	64	22	5%	95%	5%	-			3		2M	2	-
CALIFORNIA																
ANDERSON CREEK	ANDERSON	11	21	64	28	5%	95%	-	3,000		2			-	4	-
DRAIN CANAL A	BISHOP	5	14	64	11	100%		-	-		2			4M	1	-
D CANAL 20-22 AVE	BLYTHE	10	18	64	11	77%	23%	-	1,525		2			2M	3	-
F CANAL 6-8TH AVE	BLYTHE	9	24	64	11	95%	5%	-	300			3		2M	1	12
RAMER LAKE UPPER	BRAWLEY	9	26	64	11	5%	95%	-	1,000		2			25A	1	-
DEER CREEK	CALIF HOT SPRNG	6	9	64	34	100%		-	300	1				2M	-	4
ROHNER CR-EEL RIV	FORTUNA	4	17	64	33	20%	80%	-	1,000		2			3M	3	-
HAYFORK CREEK	HAYFORK	10	28	64	28	10%	90%	-	10,000	1				5M	2	-
IRRIG CAN LIFT #1	MENDOTA	9	1	64	11	10%	90%	-	11,000		2			6M	2	-
FARM POND D RANCH	MERCED	6	27	64	11	100%		-	-		2			4A	5	-
UNNAMED LAKE	MOSS LANDING	6	13	64	12		100%	-	4,000		2			3A	3	-
S FORK WILLOW CR	NORTH FORK	4	27	64	28	90%	10%	-	650	1				4M	2	-
SAN ANTONIO CREEK	OAKLAND	7	16	64	31	33%	67%	66%	2,175			3		1M	1	-
D CANAL SOUTH END	PALO VERDE	10	22	64	11	25%	75%	-	1,000		2			1M	5	-
SAN FRANCISCO BAY	SAN FRANCISCO	4	13	64	50	100%		-	515				4	1M	2	-
SAN FRANCISCO BAY	SAN FRANCISCO	4	14	64	50	100%		-	4 25				4	1M	1	-
LOS ANGELES HARB	SAN PEDRO	9	17	64	24		100%	100%	100				-	2A	-	6
SANTA BARB HARBOR	SANTA BARBARA	9	10	64	31	1%	99%	95%	2,000,000		2			84A	1	-
KANEAH RIVER	THREE RIVERS	7	8	64	35	10%	90%	-	2,000	1				3M	1	-
UNNAMED IRR CANAL	TRANQUILLITY	7	25	64	11	20%	80%	-	10,000	1				2M	3	-
LOS ANGELES HARB	WILMINGTON	9	17	64	25		100%	100%	5,100			3		90A	-	-
LOS ANGELES HARB	WILMINGTON	9	18	64	25		100%	100%	30,000		2			-	-	-
LOS ANGELES HARB	WILMINGTON	9	29	64	25		100%	100%	20,000		2			100A	-	-
LOS ANGELES HARB	WILMINGTON	10	2	64	25		100%	100%	35,000		2			120A	-	-
LOS ANGELES HARB	WILMINGTON	10	21	64	25		100%	98%	340,000		2		-	55A	34	-

Report of Pollution-Caused Fish Kills

Cumulative Listing of Reports Received as of Date of Listing

OPERATIONS CODES

- **10 Agricultural Operations**
  - 11 Poisons (*Herbicides, Pesticides, etc.*)
  - 12 Fertilizers
  - 13 Manure, Silo, Feedlot Drainage, etc.
- **20 Industrial Operations**
  - 21 Mining
  - 22 Food & Kindred Products
  - 23 Paper & Allied Products
  - 24 Chemicals
  - 25 Petroleum
  - 26 Metals
  - 27 Combinations
  - 28 Other
- **30 Muncipal Operations**
  - 31 Sewerage System
  - 32 Refuse Disposal
  - 33 Water System
  - 34 Swimming Pool
  - 35 Power
- **40 Transportation Operations**
  - 41 Rail
  - 42 Truck
  - 43 Barge or Boat
  - 44 Pipe Line
- **50 Other Operations**
- **90 Unknown** (See next table, p. 23)

Report of Pollution-Caused Fish Kills (Continued)

Cumulative Listing of Reports Received as of Date of Listing

RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL MONTH	DAY	YEAR	OPERATIONS INDICATED AS RESPONSIBLE FOR KILL (SEE CODES BELOW)	TYPE OF FISH KILLED PERCENT GAME	PERCENT FORAGE	PERCENT OF KILL RECREATIONAL OR COMMERCIAL VALUE	ESTIMATED NUMBER OF FISH KILLED	SEVERITY TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)	ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT DA	MO
COLORADO																
ARKANSAS RIVER	GRANITE	11	2	64	42	80%	20%	-	500			3		7M	-	-
ARKANSAS RIVER	GRANITE	11	3	64	42	70%	30%	-	500				4	7M	2	-
CONNECTICUT																
UNNAMED STREAM	CHESHIRE	7	25	64	11	2%	98%	-	-		2			-	-	-
WHITE OAK LAKE	EAST HARTFORD	6	20	64	31	5%	95%	-	200			3		-	4	-
MUDDY POND	STAFFORD SPRNGS	8	7	64	28	10%	90%	-	-		2			10A	1	-
BRANCH BROOK	THOMASTON	5	21	64	28	10%	90%	-	300		2			2M	1	-
FLORIDA																
PEACE RIVER	FORT MEADE	10	25	64	21	20%	80%	-	-	1				4M	2	-
LAKE JESSUP	SANFORD	5	30	64	31	4%	96%	2%	1,000,000		2			7,740A	5	-
GEORGIA																
CHATTAHOOCHEE RIV	ATLANTA	8	13	64	31	70%	30%	-	-		2			6M	1	-
ATTAPULGUS CREEK	ATTAPULGUS	6	20	64	24	67%	33%	-	750	1				16M	3	-
WARRENS POND	OCILLA	7	29	64	11	100%		-	-	1				-	3	-
POPES POND	OCILLA	7	29	64	11	100%		-	-	1				5A	1	-
JOWERS POND	OCILLA	8	4	64	11	100%		-	-		2			-	-	-
OQUINA CREEK	THOMASVILLE	9	19	64	22	-	-	-	-			3		8M	-	-
SWIFT CREEK	VIDALIA	5	29	64	31		100%	-	-				4	1M	1	-
IDAHO																
IRR DITCH BOISE R	BOISE	6	11	64	28	2%	98%	-	1,500	1				-	2	-
STRIKE RS-SNAKE R	BRUNEAU	6	25	64	11	1%	99%	-	2,500			3		5M	1	-
BOISE RIVER	CALDWELL	5	20	64	22	2%	98%	-	700	1				5M	-	-
ILLINOIS																
INDIAN CREEK	ABINGTON	4	17	64	26	3%	97%	11%	3,421	1				-	2	-
JORDAN CREEK	FAIRMOUNT	5	12	64	12	5%	95%	97%	39,840		2			-	-	9
FOX RIVER	GENEVA	1	3	64	26	1%	99%	99%	901				4	1M	-	-
FOX RIVER	GENEVA	1	11	64	31		100%	100%	-				4	1M	1	-
HORSESHOE LAKE	GRANITE CITY	1	26	64	26	65%	35%	17%	11,788			3		200A	3	-
HORSESHOE LAKE	GRANITE CITY	10	29	64	26	63%	37%	97%	2,970				4	1A	3	-
COON CREEK	HAMPSHIRE	7	21	64	22	1%	99%	1%	185,451		2			15M	1	-
SANGAMON RIVER	ILLIOPOLIS	8	23	64	31	29%	71%	72%	88,704		2			25M	5	-
HICKORY CREEK	JOLIET	6	12	64	23	1%	99%	25%	3,703			3		1M	-	12

OPERATIONS CODES

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- 11 Poisons (*Herbicides, Pesticides, etc.*)
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20 Industrial Operations
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- 22 Food & Kindred Products
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- 28 Other

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- 31 Sewerage System
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- 33 Water System
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- 35 Power

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- 41 Rail
- 42 Truck
- 43 Barge or Boat
- 44 Pipe Line

50 Other Operations

90 Unknown (See next table, p. 23)

RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL: MONTH	DAY	YEAR	OPERATIONS INDICATED AS RESPONSIBLE FOR KILL (SEE CODES BELOW)	TYPE OF FISH KILLED: PERCENT GAME	PERCENT FORAGE	PERCENT OF KILL WHICH WAS OF COMMERCIAL VALUE	ESTIMATED NUMBER OF FISH KILLED	SEVERITY: TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)	ESTIMATED MILES OR ACRES AFFECTED	DURATION OF TOTAL EFFECT: DA	MO
ILLINOIS (CONT)																
ROCK RIVER	OREGON	1	5	64	22	57%	43%	57%	70				4	-	6	-
VERMILION R E BR	PAXTON	5	13	64	91	13%	87%	95%	14,167			3		8M	1	-
BUREAU CREEK	PRINCETON	6	12	64	91	17%	83%	80%	619			3		-	-	-
KENT CR MAIN STRM	ROCKFORD	8	5	64	93	2%	98%	96%	900			3		1M	-	2
ROCK RIVER	ROCKFORD	8	12	64	26	24%	76%	57%	5,575			3		3M	-	8
COAL CREEK	SHEFFIELD	9	27	64	22	1%	99%	8%	29,412	1				5M	-	-
L ROBERTSON POND	SIMS	3	13	64	19	28%	72%	72%	98		2			1A	-	-
SUGAR CREEK	SPRINGFIELD	5	27	64	91	15%	85%	2%	9,315			3		4M	-	12
INDIANA																
RUSSERON CREEK	CARLISLE	8	27	64	21	35%	65%	-	350	1				3M	5	-
WHITE RIVER	CENTERTON	11	17	64	10	5%	95%	-	-				-	-	-	-
BIG CREEK DITCH	CHALMERS	6	18	64	91	20%	80%	-	1,000		2			3M	1	-
OHIO RIVER	CLARKSVILLE	7	30	64	91	25%	75%	-	2,000		2			1M	-	-
LICK CREEK	CONNERSVILLE	9	28	64	28		100%	-	1,800			3		1M	1	-
SAINT MARYS RIVER	FORT WAYNE	8	3	64	91		100%	-	1,000		2			3M	5	-
MAUMEE RIVER	FORT WAYNE	9	21	64	91	15%	85%	-	1,800		2			5M	2	12
FALL FORK	GREENSBURG	6	25	64	42		100%	-	200				4	1M	-	-
CONSERVTN DEP LK	GREENSBURG	12	14	64	26	100%		-	9,000		2			25A	14	-
WABASH RIVER	LOGANSPORT	6	29	64	41		100%	-	500				4	-	-	-
MUSCATATUCK RIVER	NORTH VERNON	12	10	64	91	10%	90%	-	200			3		8M	1	-
WHITE LICK CREEK	PLAINFIELD	7	24	64	91	5%	95%	-	300	1				3M	2	-
DEER CREEK	PUTNAMVILLE	6	3	64	91	20%	80%	-	2,000		2			-	1	-
MISSISSINEWA RIV	UNION CITY	12	16	64	26	5%	95%	-	300			3		3M	1	-
WALNUT CREEK	WARSAW	8	20	64	91		100%	-	300				4	1M	1	-
IOWA																
BUCK CREEK	BUCK CREEK	6	17	64	91	2%	98%	-	-	1				-	-	-
ROCK CREEK	COMANCHE	4	22	64	29	10%	90%	-	6,000	1				-	-	-
MIDDLE RACCOON R	CARROLL	7	26	64	29	1%	99%	-	10,000			3		7M	1	-
CEDAR RIVER	CEDAR RAPIDS	8	10	64	91	3%	97%	-	47,000		2			-	10	-
MILL CREEK	CLARENCE	6	12	64	91	2%	98%	-	2,500	1				-	-	-
JIM CREEK	DEXTER	5	2	64	91	20%	80%	-	1,500			3		-	-	-
KEG CREEK	GLENWOOD	6	5	64	91	3%	97%	-	2,000		2			-	1	-
MIDDLE RACCOON R	GUTHRIE CENTER	9	4	64	28		100%	-	250			3		-	2	-
MISSISSIPPI RIVER	KEOKUK	8	3	64	22	50%	50%	-	250		2			-	-	-
ROCK CREEK	OSAGE	6	21	64	22	15%	85%	-	-	1				-	2	-
YELLOW RIVER	POSTVILLE	5	19	64	22	10%	90%	-	1,000		2			4M	-	-
BUCK CREEK	RYAN	6	12	64	22	5%	95%	-	1,200		2			-	-	-
YELLOW RIVER	VOLNEY	6	21	64	22		100%	-	-			3		2M	2	-
KANSAS																
COTTONWOOD RIVER	CEDAR POINT	9	11	64	19	25%	75%	35%	18,000		2			2M	1	12
OTTER CREEK	CLIMAX	6	23	64	19	15%	85%	10%	500			3		1M	-	8
COTTONWOOD RIVER	COTTONWD FALLS	9	14	64	19	20%	80%	30%	340,000		2			7M	2	-
WALNUT RIVER W BR	FLORENCE	1	5	64	91	10%	90%	20%	75,000		2			22M	4	-
ELK RIVER	ELK CITY	4	11	64	19	2%	98%	5%	1,000		2			1M	2	12

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- 42 Truck
- 43 Barge or Boat
- 44 Pipe Line

50 Other Operations

90 Unknown (See next table, p. 23)

Report of Pollution-Caused Fish Kills (Continued)

Cumulative Listing of Reports Received as of Date of Listing

OPERATIONS CODES

- **10 Agricultural Operations**
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RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL: MONTH	DAY	YEAR	OPERATIONS INDICATED AS RESPONSIBLE FOR KILL (SEE CODES BELOW)	TYPE OF FISH KILLED: PERCENT GAME	PERCENT FORAGE	PERCENT OF KILL CHEMICAL VALUE	ESTIMATED NUMBER OF FISH KILLED	SEVERITY: TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)	ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CHEMICAL EFFECT: DA	MO
KANSAS (CONT)																
ELK RIVER	ELK CITY	5	28	64	13	5%	95%	10%	2,000			3		2M	-	6
COTTONWOOD RIVER	EMPORIA	10	30	64	13	25%	75%	50%	240,000		2			11M	2	-
SPRING CREEK	FAIRVIEW	4	5	64	13	10%	90%	60%	31,500		2			5M	5	-
SPRING CREEK	FAIRVIEW	8	29	64	13	20%	80%	20%	40,000		2			4M	3	-
ARKANSAS RIVER	FORT DODGE	5	31	64	13	10%	90%	60%	365,000			3		40M	2	-
ARKANSAS RIVER	FORT DODGE	7	31	64	13	40%	60%	30%	3,000			3		15M	2	-
ARKANSAS RIVER	FORT DODGE	8	20	64	13	20%	80%	20%	2,000			3		10M	2	-
WET WALNUT CREEK	GREAT BEND	5	30	64	13	49%	51%	80%	20,000		2			10M	3	-
PRIVATE FARM POND	HAVILAND	5	21	64	11	5%	95%	10%	100			3		-	2	-
LIME CREEK	HERINGTON	2	1	64	41	100%		75%	200				4	1M	2	-
FRENCH CREEK	HILLSBORO	4	24	64	22	80%	20%	5%	1,000		2			4M	-	8
SO COTTONWOOD RIV	HILLSBORO	6	30	64	13	40%	60%	20%	2,000			3		3M	2	-
COW CREEK-ARK RIV	HUTCHINSON	10	6	64	35	3%	97%	5%	800			3		4M	1	-
PAWNEE RIVER	JETMORE	5	11	64	13	5%	95%	10%	190			3		1M	7	-
PAWNEE RIVER	LARNED	9	15	64	34	30%	70%	30%	2,000		2			1M	1	-
FRISCO LAKE	OLATHE	7	29	64	90	99%	1%	5%	77,000	1				-	-	-
WHITEWATER RIV	POTWIN	8	20	64	13	60%	40%	25%	55,560		2			5M	3	-
MARAIS D CYGNES R	RANTOUL	7	29	64	41	20%	80%	25%	4,000			3		4M	2	-
SPRING RIVER	RIVERTON	1	19	64	31	50%	50%	50%	1,500			3		1M	-	6
PAWNEE RIVER	ROZEL	4	26	64	11	25%	75%	30%	1,500			3		2M	2	-
BIG ARKANSAS RIV	WICHITA	5	27	64	31	5%	95%	40%	67,000		2			10M	1	-
LOUISIANA																
COBURN CR-PEARL R	BOGALUSA	7	14	64	23	25%	75%	40%	400			3		1M	1	-
CUT OFF CANAL	CUT OFF	8	1	64	11	20%	80%	40%	300			3		2M	1	-
BAYOU LAFOURCHE	CUT OFF	7	31	64	11	15%	85%	30%	875			3		4M	2	-
BAYOU DE CAILLOU	DULAC	7	27	64	11	25%	75%	40%	3,500		2			17M	2	-
BAYOU TECHE	FRANKLIN	8	20	64	11	15%	85%	35%	875			3		5M	1	-
FRANKLIN CANAL	FRANKLIN	8	20	64	11	15%	85%	30%	500			3		2M	1	-
EIGHTY ARPENT CAN	HAHNVILLE	7	22	64	11	25%	75%	40%	1,250		2			3M	2	-
THERIOT CANAL	HOUMA	7	1	64	11	35%	65%	30%	5,000		2			-	2	-
BAYOU BLACK	HOUMA	7	6	64	11	20%	80%	40%	3,000			3		-	-	-
BAYOU BLACK	HOUMA	8	11	64	11	15%	85%	20%	2,000		2			3M	1	-
BAYOU BLACK	HOUMA	8	18	64	11	15%	85%	30%	700		2			3M	1	-
BAYOU BLACK	HOUMA	8	24	64	11	15%	85%	35%	-		2			7M	1	-
BAYOU BLACK	HOUMA	8	26	64	11	10%	90%	25%	500			3		2M	2	-
LA DES ALLEMANDS	KRAEMER	8	11	64	11	20%	80%	35%	800		2			5A	2	-
LARADIEVILLE CANL	LARADIEVILLE	7	15	64	11	30%	70%	30%	600		2			4M	2	-
COMPANY CANAL	LOCKPORT	7	9	64	11	30%	70%	40%	2,000		2			-	1	-
BAYOU LAFOURCHE	LOCKPORT	8	27	64	11	15%	85%	35%	275			3		-	-	-
BAYOU DE LAC	MARKSVILLE	8	27	64	11	15%	85%	30%	300				4	2M	1	-
OUACHITA RIVER	MONROE	7	14	64	29	20%	80%	40%	150				4	2M	1	-
BAYOU DE LOUTRE	MONROE	7	27	64	11	30%	70%	40%	875			3		5M	1	-
OUACHITA RIVER	MONROE	8	11	64	11	25%	75%	30%	500			3		2M	1	-
LITTLE LAKE	MONTEGUT	8	10	64	11	20%	80%	35%	750			3		2A	1	-
CANCIENNE CANAL	NAPOLEONVILLE	7	9	64	11	20%	80%	30%	450		2			4M	1	-
LAKE VERRET	NAPOLEONVILLE	8	12	64	11	25%	75%	35%	875			3		8A	1	-
BAYOU CHOCTAW	PLAQUEMINE	7	27	64	11	30%	70%	40%	9,000		2			10M	2	-
BAYOU CHOCTAW	PLAQUEMINE	8	10	64	11	25%	75%	30%	1,500		2			7M	1	-
LITTLE RIVER	POLLOCK	8	24	64	11	20%	80%	40%	2,750		2			9M	2	-
THERIOT CANAL	RACELAND	7	21	64	11	20%	80%	30%	300			3		2M	1	-
LAKE ST JOHN	ST JOSEPH	9	10	64	11	25%	75%	35%	500			3		4A	2	-
BAYOU TECHE	ST MARTINVILLE	7	20	64	11	15%	85%	20%	1,000		2			5M	2	-
LOGGY BAYOU	SPRINGHILL	8	29	64	11	30%	70%	25%	250				4	4M	1	-
BAYOU CHEVREUIL	THIBODAUX	7	9	64	11	30%	70%	30%	8,250		2			5M	2	-

River or Lake Affected	Nearest Town or City	Date of Kill: Month	Day	Year	Operations Indicated as Responsible for Kill (See Codes Below)	Type of Fish Killed: Percent Game	Percent Forage	Percent of Kill Which Was of Commercial Value	Estimated Number of Fish Killed	Severity: Total (1)	Heavy (2)	Moderate (3)	Light (4)	Estimated Miles or Acres Affected	Duration of Critical Effect: Days	Weeks
LOUISIANA (CONT)																
GRAND BAYOU	THIBODAUX	7	9	64	11	20%	80%	30%	250		2			2M	1	-
BAYOU CHEVREUIL	THIBODAUX	7	14	64	11	30%	70%	40%	55		2			2M	2	-
SAM FORT CANAL	THIBODAUX	7	18	64	11	20%	80%	35%	1,500		2			5M	1	-
HALPIN CANAL	THIBODAUX	7	21	64	11	25%	75%	30%	225		2			3M	1	-
OUTFALL CANAL	THIBODAUX	8	1	64	11	20%	80%	35%	625			3		2M	1	-
LAKE CONCORDIA	VIDALIA	9	10	64	11	25%	75%	35%	450			3		3A	1	-
GRAND BAYOU	WHITE CASTLE	6	29	64	11	40%	60%	35%	7,000		2			7M	2	-
GODCHAUX CANAL	WHITE CASTLE	7	9	64	11	20%	80%	30%	-		2			1M	1	-
PIERRE PORT BAY	WHITE CASTLE	7	9	64	11	30%	70%	30%	200		2			2M	1	-
CRACKHEAD CANAL	WHITE CASTLE	7	9	64	11	20%	80%	30%	87		2			2M	1	-
WHITE CASTLE CANL	WHITE CASTLE	8	21	64	11	25%	75%	30%	500			3		4M	1	-
MAINE																
ALLEN STREAM	EXETER	7	-	64	11	10%	90%	-	-		2			-	-	-
MASSACHUSETTS																
CHARLES RIVER	DEDHAM	6	10	64	91	20%	80%	-	1,000		2			-	2	-
NORTH POND	HOPKINTON	6	25	64	50	50%	50%	-	1,500			3		-	2	-
MERRIMACK RIVER	LAWRENCE	7	2	64	26		100%	-	4,000		2			8M	-	12
QUINEBAUG RIVER	SOUTHBRIDGE	6	3	64	28		100%	-	200				4	2M	1	-
UNPACHEENE RIVER	SOUTHFIELD	7	9	64	24	40%	60%	-	500			3		3M	2	-
MICHIGAN																
RAISIN RIVER	ADRIAN	8	18	64	22	8%	92%	-	450	1				1M	2	-
KALAMAZOO RIVER	ALBION	7	17	64	26	23%	77%	-	195				4	1M	-	3
BLACK RIVER	BANGOR	9	10	64	31	17%	83%	-	360			3		1M	-	2
LITTS CREEK	CHELSEA	9	9	64	26	25%	75%	-	80				4	1M	-	12
TOBACCO RIVER	CLARE	7	2	64	31	10%	90%	-	736		2			1M	1	-
DEER CREEK	COOPERSVILLE	7	17	64	22	18%	82%	-	829		2			5M	1	-
PAINT CREEK	LAKE ORION	10	20	64	31	100%		-	500	1				1M	2	-
TITTABAWASSEE RIV	MIDLAND	4	14	64	24	1%	99%	-	14,250		2			4M	6	-
CLINTON RIVER	MOUNT CLEMENS	7	14	64	31		100%	-	100	1				2M	1	-
ST JOSEPH RIVER	NILES	7	5	64	27	5%	95%	-	2,000		2			1M	1	-
SHIAWASSEE RIVER	OWOSSO	8	10	64	31	100%		-	-	1				1M	-	12
UPPER SILVER LAKE	PONTIAC	4	29	64	50	78%	22%	-	1,260			3		8A	3	-
ROGUE RIVER	ROCKFORD	6	11	64	27	2%	98%	-	3,075		2			2M	1	-
SEBEWAING RAY	SEBEWAING	10	29	64	22	80%	20%	-	765				-	1M	2	-
MINNESOTA																
BUFFALO CREEK	BUFFALO LAKE	7	3	64	22	-	-	-	-				-	6M	-	-
STANCHFIELD CREEK	CAMBRIDGE	6	12	64	22	1%	99%	-	90			3		1M	1	-

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- 42 Truck
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Report of Pollution-Caused Fish Kills (Continued)

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MINNESOTA (CONT)																
CROW RIVER	LITCHFIELD	7	18	64	91	10%	90%	-	60			3		4M	1	-
GUN CLUB LAKE	SAINT PAUL	2	5	64	28		100%	-	2,000				4	-	-	-
COTTONWOOD RIVER	SLEEPY EYE	8	24	64	23	-	-	-	-			3		2M	-	-
MISSOURI																
CEDAR CREEK	ASHLAND	11	18	64	21	5%	95%	-	9,600			3		8M	-	-
OLD CASTOR RIVER	AVERY	8	1	64	11	25%	75%	-	2,000		2			2M	5	-
DITCH NO 1	BERNIE	5	9	64	11	10%	90%	-	1,000		2			5M	2	-
DITCH NO 2	BERNIE	5	9	64	11	10%	90%	-	1,500		2			5M	2	-
WINCHESTER POND	BERNIE	5	15	64	11	100%		-	100			3		1A	1	-
BIG PINEY RIVER	CARROL	1	28	64	91		100%	-	2,000		2			1M	1	-
DELANEY POND	CARROL	7	10	64	11	100%		-	250		2			1A	5	-
DELANEY POND	CHARLESTON	6	11	64	11	100%		-	200		2			2A	1	-
L BONNE FEMME CR	COLUMBIA	9	2	64	44	20%	80%	-	300			3		1M	4	-
UNNAMED CREEK	FARMERSVILLE	5	7	64	19	5%	95%	-	250		2			2M	2	-
CRAFFORD PONDS	PISE	5	19	64	11		100%	100%	5,000	1				2A	1	-
LOOSE CREEK	FRANKENSTEIN	7	6	64	19	30%	70%	-	26,000		2			8M	2	-
BEAR CREEK	HAMATRAL	6	26	64	19	50%	50%	-	175	1				2M	5	-
LITTLE OSAGE RIV	HORTON	8	15	64	22	25%	75%	-	10,000		2			6M	-	-
DITCH NO 1	IDALIA	5	17	64	11	60%	40%	-	500		2			1M	4	-
FRAZEE POND	KNOX CITY	6	10	64	11	100%		-	450		2			1A	1	-
DITCH NO 10	LAVALLE	5	15	64	11	30%	70%	-	800		2			2M	5	-
BUFFALO CREEK	LOUISIANA	4	22	64	24	5%	95%	-	4,000		2			1M	7	-
ELK FORK SALT RIV	MADISON	5	24	64	91	20%	80%	-	4,500		2			56M	1	-
DITCH NO 14	MALDEN	5	19	64	11	20%	80%	-	1,000		2			5M	2	-
SALT FORK	MARSHALL	2	2	64	91	10%	90%	-	10,000		2			5M	-	-
SALT FORK	MARSHALL	11	10	64	91	20%	80%	-	2,000		2			5M	5	-
LOCUST CR E FORK	MILAN	5	8	64	23	25%	75%	-	250	1				5M	5	-
SEVERAL STREAMS	NEW MADRID CO	6	15	64	11	20%	80%	-	42,600		2			90M	7	-
HARPER POND	ORLY	5	28	64	11	100%		-	50			3		1A	1	-
PIERCE CITY LAKE	PIERCE CITY	7	1	64	36	100%		-	9,000		2			1A	1	-
CLEAR CREEK	PIERCE CITY	7	10	64	34		100%	-	-		2			1M	1	-
LITTLE DRY FORK	ROLLA	11	19	64	91	20%	80%	-	8,400		2			7M	6	-
FLAT CREEK	SEDALIA	5	4	64	27	50%	50%	-	1,750		2			5M	4	-
FLAT CREEK	SEDALIA	5	23	64	27		100%	-	500		2			5M	20	-
SOUTH CREEK	SPRINGFIELD	10	26	64	19	60%	40%	-	-		2			1M	2	-
THOMPSON RIVER	TRENTON	8	19	64	91	20%	80%	-	1,000				4	20M	5	-
WASTE POND	VIBURNUM	1	27	64	21	100%		-	150				-	1A	-	-
MILLER POND	WYATT	5	22	64	11	100%		-	100		2			2A	1	-
BREWER LAKE	WYATT	5	20	64	11	20%	80%	-	-				4	2A	1	-
MONTANA																
STILLWATER RIVER	COLUMBUS	8	17	64	11	5%	95%	-	-				4	-	1	-
DOUGLAS CREEK	HALL	4	5	64	21	100%		-	-		2			5M	2	-

RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL: MONTH	DAY	YEAR	OPERATIONS INDICATED AS RESPONSIBLE FOR KILL (SEE CODES BELOW)	TYPE OF FISH KILLED: PERCENT GAME	PERCENT FORAGE	PERCENT OF KILL WHICH WAS OF COMMERCIAL VALUE	ESTIMATED NUMBER OF FISH KILLED	SEVERITY: TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)	ESTIMATED MILES OR ACRES AFFECTED	DURATION OF TOTAL FISH KILL: HOURS	DAYS
NEBRASKA																
BLUE CUTOFF	BEATRICE	5	-	64	41	10%	90%	4%	1,500		2			3M	1	-
BLUE RIVER	BEATRICE	5	-	64	50	20%	80%	20%	3,000		2			1M	1	-
LITTLE BLUE RIVER	FAIRBURY	8	1	64	31	50%	50%	-	7,000		2			4M	-	16
MURPHYS LAKE	FREMONT	5	-	64	11	10%	90%	4%	1,500			3		6A	2	-
MASTICKS NAVAL LK	MASTICKS	7	-	64	11		100%	-	4,000	1				5A	2	-
TURKEY CREEK	MILLIGAN	7	27	64	91	90%	10%	-	-	1				1M	1	-
THOMPSON FARM POND	ASHTON	5	27	64	11	100%		-	175				4	-	-	-
NEVADA																
TRUCKEE RIVER	RENO	7	7	64	33	10%	90%	-	2,000			3		1M	1	-
WINNEMUCCA CREEK	WINNEMUCCA	7	-	64	21	100%		-	-		2			1M	2	-
NEW HAMPSHIRE																
BOW BOG BROOK	BOW	7	11	64	11		100%	-	-		2			1M	-	12
MERRIMACK RIVER	CONCORD-BOW	7	9	64	91		100%	-	-		2			1M	-	12
AMMOSLOT RIVER	EFFORT	8	7	64	50	75%	25%	-	-			3		1M	-	12
WINNISQUAM LAKE	LACONIA-BELMONT	7	10	64	11	85%	15%	-	-				4	200A	1	-
WINNISQUAM LAKE	LACONIA-BELMONT	7	22	64	11	90%	10%	-	-				4	200A	-	12
WINNISQUAM LAKE	LACONIA-BELMONT	8	25	64	11	5%	95%	-	-			3		200A	-	12
NASHUA CANL & RIV	NASHUA	6	29	64	91	5%	95%	-	-		2			10M	1	-
NEW JERSEY																
PERMADUSTAG RR	HOT DIVER	7	19	64	24	100%		-	20				4	-	-	-
PENNYPACKER CREEK	RODAWAY	9	26	64	44	5%	95%	-	200				4	1M	1	-
DELAWARE RIVER	BUTLER	6	7	64	24	10%	90%	-	100			3		1M	2	-
WALLKILL RIVER	FRANKLIN	9	21	64	24	10%	90%	-	900		2			7M	-	-
HOHOKUS-SADDLE BROOK	FAIRVIEW	1	20	64	50	-	-	-	-				4	3M	-	-
DELAWARE RIVER	FLEMINGTON	7	22	64	22		100%	-	300		2			3M	3	-
DELAWARE RIVER	HARMONY TWP	1	17	64	44	-	-	-	-			3		10M	-	-
DIXONS POND	MOUNTAIN LAKES	6	29	64	22		100%	-	150				4	1A	1	-
DIXONS POND	MOUNTAIN LAKES	7	6	64	22		100%	-	75				4	1A	2	-
DARFORD LAKE	NEW EGYPT	8	12	64	91	10%	90%	-	2,000		2			2A	4	-
DEVILS BROOK	PLAINSBORO	11	5	64	50	10%	90%	-	200			3		2M	2	-
WATERS RUN	RIVERSIDE	8	26	64	42	35%	65%	-	1,150		2			-	2	-
NEW MEXICO																
DEL RIO DRAIN CAN	LAS CRUCES	11	-	64	91	95%	65%	-	-	1				5M	-	-
NEW YORK																
BROOK AT ROUTE 14	NO NAME	8	22	64	11		100%	-	2,500		2			1A	2	-
ELLICOTT CREEK	ALDEN	7	22	64	91		100%	-	250			3		1M	-	-
ELLICOTT CREEK	AMHERST	7	29	64	91		100%	-	250				-	1M	-	-
ERDEKAMP CREEK	ROCKAPORT	7	25	64	91	-	-	-	-				-	3M	-	-

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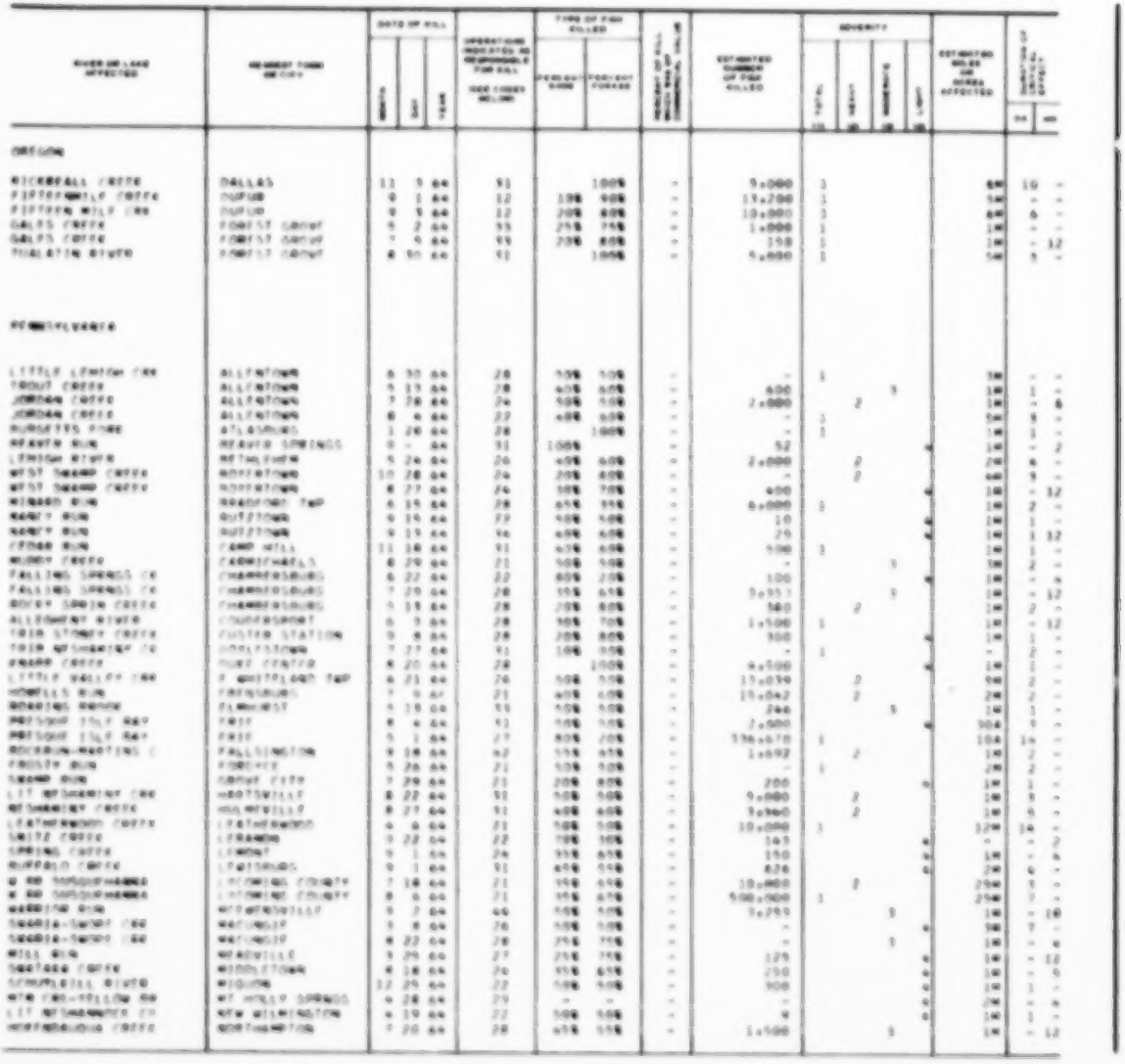
NEW YORK (CONT)																
HAVANA GLEN STR	CATHERINE	7	18	64	19		100%	-	4,500		2			3M	-	-
HAVANA GLEN STR	CATHERINE	6	2	64	19	50%	50%	-	350		2			1M	-	-
CANASERAGA CREEK	DANSVILLE	7	15	64	26	2%	98%	-	25,000		2			1M	-	-
BEAVERDAM BROOK	PERRYDALE	9	5	64	19	4%	96%	-	2,100	1				2M	-	-
ISCHUA CREEK	FRANKLINVILLE	9	11	64	26	4%	96%	-	15,000	1				1M	-	-
LITTLE SALMON DIV	MEXICO	7	22	64	22	2%	98%	-	2,400		2			-	2	-
STATE BARGE CANAL	ROCHESTER	11	13	64	22		100%	-	950		2			1M	-	-
SALMON CREEK	PARMA	7	30	64	11		100%	-	1,500		2			1M	-	-
POND CREEK	TAYLOR	8	24	64	22	-	-	-	-				4	1M	-	-
DELAWARE DIV W SB	WALTON	7	22	64	22	2%	98%	-	7,500		2			5M	-	-
KANASTANDA CREEK	GARRICK	7	16	64	26	5%	95%	-	10,000	1				1M	-	-
SENECA RIVER	WATERLOO	8	10	64	31		100%	-	75,000		2			1M	1	-
TROUTDISTOWN BROOK	TOWNERS	7	31	64	50	5%	95%	-	2,500		2			1M	-	-
NORTH CAROLINA																
CAPE RIVER	BURGAWVILLE	6	16	64	28		100%	5	1,500			3		1M	-	6
SOUTH TOPSIO DIV	CONCERNET	7	3	64	28	30%	70%	60%	250				4	6M	-	12
TAR RIVER	GRIFFINVILLE	6	2	64	31		100%	-	1,200				4	1M	-	-
WILSON RET-DEW R	JAMESONVILLE	6	15	64	31		100%	10%	500				4	1A	-	6
LAWSON CREEK EST	NEW BERN	9	16	64	32		100%	100%	2,345				4	1A	-	2
NORTH DAKOTA																
SOURIS RIVER	MINOT	9	20	64	31	20%	80%	-	62,500		2			-	-	-
OHIO																
GREENSDALE DITCH	BELOIT	6	18	64	28	25%	75%	-	45	1				-	-	-
ROCKY RIVER	BRUNSWICK	7	7	64	31		100%	-	93					-	-	-
MIDDLEFORK CREEK	CADIZ	7	20	64	31	-	-	-	1,718				-	-	-	-
SCIOTO RIVER	CIRCLEVILLE	7	20	64	31		100%	-	-		2			5M	-	-
MILL CR WEST FORK	COLERAIN	5	5	64	31	90%	10%	-	440	1				2M	-	-
SCIOTO RIVER	COLUMBUS	5	29	64	31	5%	95%	-	45				-	-	2	-
SUGAR CREEK	DOVER	7	22	64	27	2%	98%	-	1,180				-	5M	-	-
MOSQUITO CREEK	EAST ORWELL	6	9	64	19	50%	50%	-	104				-	1M	-	-
BIG WALNUT CREEK	GAHANNA	7	7	64	31		100%	-	53		2			-	-	-
BEAVER CREEK	HARMONY	6	25	64	11	25%	75%	-	18,228		2			2M	-	-
TURTLE CR & TRIB	LEBANON	7	30	64	26	1%	99%	-	40,000		2			-	-	-
BEAVER CREEK TRIB	MAHONING COUNTY	6	12	64	11	100%		-	200	1				-	-	-
GREAT MIAMI RIVER	MIDDLETOWN	7	9	64	26		100%	-	6,715			3		2M	-	-
DUSHANTY CREEK	MILLERSBURG	7	27	64	22	2%	98%	-	1,400			3		1M	-	-
GREAT MIAMI RIVER	NEW MIAMI	7	13	64	21	1%	99%	-	7,886,960				-	5M	-	-
RILEY CREEK	PARDEEVA	6	25	64	26	50%	50%	-	11,169		2			1M	2	-
CROWED CREEK	UNRICHSVILLE	6	11	64	11	10%	90%	-	1,010				4	1M	1	-
JENNINGS CREEK	VAN WERT COUNTY	6	8	64	22	40%	60%	-	905				-	2M	4	-
APPLE CREEK	WOOSTER	7	6	64	29		100%	-	51				-	-	-	-



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50 Other Operations

99 Unknown (See next table, p. 21)

WATERSHED AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL: MONTH	DAY	YEAR	OPERATIONS INDICATED AS RESPONSIBLE FOR KILL (SEE CODES BELOW)	TYPE OF FISH KILLED: PREDOMINANT KINDS	SECONDARY KINDS	PERCENT OF KILL REPRESENTING COMMERCIAL VALUE	ESTIMATED NUMBER OF FISH KILLED	SEVERITY: TOTAL	HEAVY	MODERATE	LIGHT	ESTIMATED MILES OF STREAM AFFECTED	DURATION OF NOTICEABLE EFFECT: DAYS	MILES
PENNSYLVANIA (CONT																
HOOPESDALE CREEK	NORTHAMPTON	9	12	64	91	SUN	SUN	-	475				1	14	2	-
LEHIGH (DEL. CANAL)	NORTHAMPTON	9	22	64	28	SUN	SUN	-	900				1	14	1	-
OIL CREEK	OIL CITY	6	17	64	26	PIK	PIK	-	925			1		14	2	-
TOBY MANUFACTURING CO	OLEY	10	15	64	19	SUN	SUN	-	-		2			14	1	-
LITTLE MARSH CREEK	NORTHAMPTON	6	16	64	22	BUF	PIK	-	125			1		14	-	12
LEHIGH RIVER	PALMERTON	10	18	64	26	PIK	SUN	-	20,756	1				14	8	-
TOBY'S RUN STREAM	PERKASIE	6	9	64	22	SUN	SUN	-	500			1		14	1	-
PHEASANT SPRING (TRIB. TO SCHUYLKILL RIVER)	PERKASIE	11	26	64	50	SUN	SUN	-	603			1		14	2	-
SCHUYLKILL RIVER	PHILADELPHIA	12	21	64	26		100%	-	200				1	14	1	-
SANDY CREEK	POLK	9	5	64	21	-	-	-	-	1				14	1	-
LICKING RUN CREEK	QUAKERTOWN	6	23	64	29	SUN	SUN	-	1,000		2			14	2	-
LICKING RUN CREEK	QUAKERTOWN	7	15	64	29	40%	60%	-	750			1		14	2	-
LICKING RUN CREEK	QUAKERTOWN	10	27	64	24	SUN	SUN	-	1,151			1		14	-	?
TRIB. S. OF BEAVER (CONT CREEK)	QUARRYVILLE	9	8	64	22		100%	-	350				1	14	-	12
CONT CREEK	RAINSBURG	6	7	64	25	-	-	-	-				1	64	-	-
RAPP & TULPEHOCKEN (CREEK)	READING	7	1	64	24	SUN	SUN	-	5,460	1				28	4	-
FRANKSTOWN BRANCH	ROARING SPRING	7	29	64	42	SUN	SUN	-	691		2			126	5	-
FURNACE CREEK	ROSEVILLE	6	29	64	28	40%	60%	-	-		2			28	2	-
BEARING BROOK	SCRANTON	6	21	64	91	20%	80%	-	200			1		14	2	-
SHENANGO RIVER	SHARON	8	15	64	27	20%	80%	-	200				1	14	-	12
MASSON CREEK	SLIPSTOWN	11	24	64	44		100%	-	-			1		14	1	-
SLIPPERY ROCK CREEK	SLIPPERY ROCK	7	14	64	23	50%	50%	-	1,991,616	1				64	2	-
BLACK MISHANNON (CREEK)	SNOWSHOE	8	3	64	23	20%	80%	-	465			1		28	3	-
BALD EAGLE CREEK	TYRONE	9	26	64	42	30%	70%	-	-			1		14	2	-
S. BR. PENCYN CREEK	UNION CITY	9	8	64	26	25%	80%	-	72,396	1				14	2	-
FAST SANDY CREEK	VAN	7	12	64	23	40%	60%	-	-			1		14	2	-
ALLEGHENY RIVER	WARREN	9	15	64	29	10%	90%	-	61				1	14	-	5
TRIB. PENCYN CREEK	WATTSBURG	6	6	64	33		100%	-	3,000			1		14	1	-
PENCYN CREEK	WATTSBURG	9	29	64	33	40%	60%	-	14,580		2			14	3	-
RHODE ISLAND																
NARROW POND	CHARLTON	7	8	64	91	70%	30%	20%	200			1		-	-	-
SOUTH DAKOTA																
BIG SIOUX RIVER	NORTH SIOUX CITY	6	15	64	33	5%	95%	-	5,000		2			56	1	-
TENNESSEE																
DUCK RIVER	CENTERVILLE	6	27	64	21	25%	75%	97%	924				4	14	-	-
WACHOVIA DAM	CHATTANOOGA	10	7	64	24	5%	95%	45	5,000			1		2000	-	-
WACHOVIA DAM	CHATTANOOGA	11	2	64	24	2%	98%	-	1,500			1		2000	-	-
TVAN GRAVELY CREEK	CHATTANOOGA	6	23	64	24	5%	95%	-	700		2			14	2	-
LIT LIMESTONE CRK	GREENEVILLE	9	28	64	33		100%	-	-		2			28	2	-
BARRETT POND DIVERSION	MEMPHIS	9	30	64	26	15%	85%	-	150				4	14	-	2
MEMPHIS HARBOR	MEMPHIS	8	25	64	43		100%	-	250				4	105	1	-
DICKLAND CREEK	NASHVILLE	6	22	64	33	-	-	-	-				-	-	-	-
DICKLAND CREEK	NASHVILLE	9	18	64	33	8%	92%	-	660				4	14	1	-
L. PAINT VALLEY CO	PRESTONSBURG, KY.	8	3	64	50	2%	98%	-	5,940			1		14	-	3
PICKWICK DAM	LOOKOUT	10	11	64	29		100%	-	50				4	64	-	2

RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF OIL SPILL: MONTH	DAY	YEAR	OPERATIONS UNDER WHICH OIL WAS RESPONSIBLE FOR SPILL: ONE DIGIT CODE BELOW	TYPE OF OIL SPILLED: CRUDE OIL	REFINED OIL PRODUCT	QUANTITY OF OIL SPILLED: ESTIMATED NUMBER OF GALLONS SPILLED	SOURCE: TOTAL	VESSEL	BARGE	SHORE FACILITY	ESTIMATED VALUE OF PROPERTY AFFECTED	DAMAGE: FISH KILLED	BIRDS KILLED
1965															
UNNAMED LAKE	ADAMSVILLE	9	9	65	32	95	5%	-	-			1	25	1	-
CANADIAN RIVER	ARGENTA	9	1	65	91	-	-	-	-				60	1	1
CANADIAN RIVER	ARGENTA	8	-	65	91	-	-	-	-		1		60	1	1
COLORADO RIVER	AUSTIN	6	19	65	91	7%	93%	-	75,000	1			-	1	1
UNNAMED STREAM	AUSTIN	10	15	65	91	7%	93%	-	2,000				10	2	-
SCOTTS BAY (CANAL)	BAYTOWN	11	9	65	21		100%	-	100,000		2		10	2	-
UNNAMED STREAM	BEAUMONT	9	1	65	42	-	-	-	-			1	50	5	-
CLEAR CREEK	BIRDSVILLE	8	26	65	06	5%	95%	-	-		2		-	2	-
CAMP CREEK	BLESSING	1	25	65	29	100%		-	25			1	10	-	-
BRADY CREEK	BRADY	9	14	65	91	10%	90%	-	-			1	-	21	-
UNNAMED STREAM	BURNET	6	27	65	29	20%	80%	-	-		2	1	50	5	-
UNNAMED STREAM	CARTER	6	-	65	91	5%	95%	-	-			1	20	-	-
MILLER BAYOU	CLEVELAND	1	20	65	41	10%	90%	-	275		2		60	-	-
E FK SAN JACINTO	COLDSPRING	9	1	65	29	5%	95%	-	-			1	50	1	-
COTTONWOOD CREEK	DALLAS	8	6	65	26	2%	98%	6.5%	200		2		10	2	-
UNION CREEK	DRIFTWOOD	9	13	65	11	100%		-	-		2		-	5	-
TEN MILE CREEK	DUNCANVILLE	2	25	65	91		100%	-	30		2		-	5	-
COTTONWOOD CREEK	DUTCHER	1	2	65	91	20%	80%	-	-		2		-	-	-
GALVESTON BAY	GALVESTON	1	18	65	91	100%		-	50			1	50	-	-
PEN GAS CREEK	GARWOOD	5	14	65	25	50%	50%	-	-		2		15	1	-
SANDY CREEK	GARWOOD	12	2	65	29	10%	90%	-	100			1	300	7	-
LITTLE CYPRESS CR	GILMER	11	1	65	28	-	-	-	-		2		10	7	-
ARKANSA RIVER	GORMAN	1	30	65	44	-	-	-	-				-	10	-
PECOS RIVER	GRANDFALLS	9	29	65	29		100%	-	-			1	200	2	-
MOUNTAIN FOR LAKE	GREAT FALLS	7	2	65	26	10	90%	-	10,000		2		200	2	-
UNNAMED STREAM	HEMPSTEAD	1	15	65	29		100%	-	-	1			-	2	-
TIMBER RANCH CRK	HEMPSTEAD	9	25	65	13	10	90%	-	-		2		10	1	-
ILLEGIBLE	HIGHLANDS	7	16	65	10	20%	80%	-	20		2		50	-	-
PRIVATE POND	HIGHLANDVILLE	9	11	65	13	100%		-	250				10	1	-
ILLEGIBLE	ILLEGIBLE	7	23	65	10	50%	50%	-	350	1			10	-	-
CYPRESS CREEK	LONE STAR	8	17	65	26	25%	75%	-	500				10	2	-
CYPRESS CREEK	LONE STAR	9	-	65	26	10%	90%	-	-		2		10	-	8
CYPRESS CREEK	LONE STAR	6	-	65	26	10%	90%	-	100			1	-	-	6
BUFFALO SPRINGS L	LUBBOCK	8	21	65	31	10	90%	5	1,000			1	-	-	6
OSTLE AND POND	LUBBOCK	8	15	65	31	50%	50%	5	40			1	256	10	-
O O GALE POND	LUBBOCK	9	1	65	11	-	-	-	-		2		10	2	-
ARDELLNA RIVER	LUFKIN	7	30	65	29	10	90%	10	2,000		2		50	-	6
E FK TRINITY RIV	MIDLOTHIAN	7	25	65	32	60%	40%	60%	-		2		-	-	-
UNNAMED STREAM	MORTON	9	27	65	10	25%	75%	-	-			1	10	1	-
GARRISON RIVER	MOTLEY	1	30	65	46	10%	85%	-	-				-	-	-
PECOS RIVER	OZONA	9	26	65	25	-	-	-	-				-	-	-
TURTLE CREEK	PALACIOS	11	30	65	25	50%	50%	-	200			1	20	5	-
TRINIDAD BAY GAS	PALACIOS	6	9	65	26	20%	70%	-	500			1	200	9	-
UNNAMED STREAM	PHILLIPS	6	1	65	29	10%	90%	-	-		2		100	21	-
UNNAMED STREAM	SPLENDORA	2	13	65	25	5%	95%	-	300				20	12	-
LITTLE OLD CREEK	TEMPLE	7	28	65	10	10%	90%	-	200			1	10	-	-
UNNAMED STREAM	VICTORIA	5	28	65	35	-	-	-	-			1	-	-	1
UNNAMED STREAM	WILLACY MILLS	1	6	65	25	50%	50%	-	-			1	10	7	-
1966															
LOST CREEK	MORGAN	7	31	65	46	60%	40%	-	1,000	1			10	-	2

OPERATIONS UNDER

10 Agricultural Operations
- 11 Poisons (*Herbicides, Pesticides, etc.*)
- 12 Fertilizers
- 13 Manure, Silo, Feedlot Drainage, *etc.*

20 Industrial Operations
- 21 Mining
- 22 Food & Kindred Products
- 23 Paper & Allied Products
- 24 Chemicals
- 25 Petroleum
- 26 Metals
- 27 Combinations
- 28 Other

30 Municipal Operations
- 31 Sewerage System
- 32 Refuse Disposal
- 33 Water System
- 34 Swimming Pool
- 35 Power

40 Transportation Operations
- 41 Rail
- 42 Truck
- 43 Barge or Boat
- 44 Pipe Line

50 Other Operations

90 Unknown (See next table, p. 23)

Report of Pollution-Caused Fish Kills (Continued)

Cumulative Listing of Reports Received as of Date of Listing

OPERATIONS CODES

10 Agricultural Operations
- 11 Poisons (*Herbicides, Pesticides, etc.*)
- 12 Fertilizers
- 13 Manure, Silo, Feedlot Drainage, etc.

20 Industrial Operations
- 21 Mining
- 22 Food & Kindred Products
- 23 Paper & Allied Products
- 24 Chemicals
- 25 Petroleum
- 26 Metals
- 27 Combinations
- 28 Other

30 Muncipal Operations
- 31 Sewerage System
- 32 Refuse Disposal
- 33 Water System
- 34 Swimming Pool
- 35 Power

40 Transportation Operations
- 41 Rail
- 42 Truck
- 43 Barge or Boat
- 44 Pipe Line

50 Other Operations

90 Unknown (See next table, p. 23)

RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL: MONTH	DAY	YEAR	OPERATIONS INDICATED AS RESPONSIBLE FOR KILL (SEE CODES BELOW)	TYPE OF FISH KILLED: PERCENT GAME	PERCENT FORAGE	PERCENT OF KILL WHICH WAS OF COMMERCIAL VALUE	ESTIMATED NUMBER OF FISH KILLED	SEVERITY: TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)	ESTIMATED MILES OR ACRES AFFECTED	DURATION OF TOTAL KILL OR EFFECT: DA	MO
VIRGINIA																
MILL CREEK	LEAKSVILLE	5	22	64	11	-	-	-	30				4	-	-	-
RUTLEDGE CREEK	AMHERST	8	27	64	31		100%	-	3,000		2			-	-	-
DAN RIVER	DANVILLE	4	3	64	28	-	-	-	90				1	-	-	-
LEVISA FORK	GRUNDY	8	27	64	21		100%	-	10,000				1	-	-	-
HOLSTON R MID FK	MARION	9	12	64	24	-	-	-	-				1	2M	-	-
GOOSE CREEK	MONTVALE	6	4	64	25		100%	-	-			3		6M	-	-
CLINCH RIVER	RICHLANDS	9	8	64	21	6%	94%	-	31,300			3		20M	-	-
FALLING CREEK	RICHMOND	7	19	64	31	-	-	-	-				4	-	-	-
IDALSTON RIV-N FK	SALTVILLE	5	31	64	33		100%	-	200				4	-	-	-
PLEASURE HOUSE LK	VIRGINIA BEACH	8	28	64	30	90%	10%	-	4,500			3		-	-	-
LAKE WHITEHURST	VIRGINIA BEACH	6	26	64	33		100%	-	600			3		-	-	-
WASHINGTON																
SHELL CREEK	EDMONDS	4	15	64	50	100%		-	50			3		1M	-	-
COLUMBIA RIVER	KALAMA	3	11	64	27	100%		-	2,500		2			1M	2	-
BLACK RIVER	KENT	5	12	64	26	40%	60%	-	200			3		-	2	-
MILL CREEK	KENT	4	28	64	26	100%		-	200			3		-	-	-
GREEN RIVER	PALMER	6	23	64	33	100%		-	119,000		2			15M	-	-
NO FORK GREEN RIV	PALMER	7	3	64	33	100%		-	2,700		2			-	-	-
WEST VIRGINIA																
COOPERS CRK-ELK R	CHARLESTON	5	25	64	25		100%	-	100,000	1				5M	1	-
KANAWHA RIVER	CHARLESTON	9	15	64	24	43%	57%	-	400,000	1				8M	3	-
KANAWHA RIVER	MARMET	8	26	64	27	99%	1%	-	1,100			3		1M	-	-
REEDY CREEK	REEDY	11	23	64	28	57%	43%	1%	41,118		2			7M	2	-
WHEELING CREEK	WHEELING	10	30	64	22	12%	88%	-	3,000		2			2M	6	-
WISCONSIN																
TOMORROW RIVER	AMHERST	7	1	64	42	1%	99%	-	1,600				4	1M	-	2
BLAKE FORK	BLOOMINGTON	6	28	64	31	75%	25%	-	200			3		3M	1	-
BLACK EARTH CREEK	CROSS PLAINS	6	8	64	31	100%		-	40				4	1M	1	-
LAXIE CRK & TRIB	DODGEVILLE	6	24	64	42		100%	-	5,000				4	2M	1	-
FARM POND	LODI	7	2	64	11	100%		-	302	1				3A	1	-
CAMPGROUND CREEK	OAKFIELD	9	16	64	22	100%		-	100			3		6M	1	-
OCONOMOWOC RIVER	OCONOMOWOC	9	11	64	31		100%	-	600		2			2M	2	-
MULLET RIVER	PLYMOUTH	10	31	64	31		100%	-	50,000	1				10M	2	-
BIG EAU PLEINE R	STRATFORD	5	27	64	22	100%		-	212		2			1M	-	8
CITY PARK POND	WEST BEND	4	17	64	30	99%	1%	-	335		2			3A	-	6
WYOMING																
ALCOVA RESERVOIR	CASPER	8	4	64	35	100%		-	600		2			1M	2	-
DEER CREEK	GLENROCK	3	-	64	44	-	-	-	-		2			5M	10	-
N FK POPO AGIE R	LANDER	8	14	64	34	15%	85%	-	1,500		2			1M	-	4
N FK POPO AGIE R	LANDER	12	3	64	13	100%		-	18			3		1M	-	-

Report of Fish Kills—Cause Unknown

Cumulative Listing of Reports Received as of Date of Listing

RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL (MONTH DAY YEAR)	OPERATIONS INDICATED AS RESPONSIBLE FOR KILL (SEE CODES BELOW)	TYPE OF FISH KILLED (PERCENT GAME)	TYPE OF FISH KILLED (PERCENT FORAGE)	PERCENT OF KILL WHICH WAS OF COMMERCIAL VALUE	ESTIMATED NUMBER OF FISH KILLED	SEVERITY (TOTAL)	SEVERITY (HEAVY)	SEVERITY (MODERATE)	SEVERITY (LIGHT)	ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT (DA)	DURATION OF CRITICAL EFFECT (MO)
ARKANSAS														
MISSISSIPPI RIVER	ARKANSAS CITY	7 16 64	90	-	-	-	-				-	-	-	-
CALIFORNIA														
SUISUN BAY	ANTIOCH	5 21 64	90	99%	1%	-	-			3		-	57	-
NOYO RIV HARB-BAY	FORT BRAGG	8 2 64	90		100%	100%	10,000		2			-	-	-
CLEAR LAKE	LAKEPORT	7 7 64	90		100%	5	1,000				4	-	1	-
SACTO&SAN JOAQ R	PITTSBURG	8 21 64	90	99%	1%	-	17				4	3M	-	2
STEVENS CR RESVR	REDWOOD CITY	4 19 64	90	100%		-	506			3		-	2	-
CONNECTICUT														
TROUT BROOK	WEST HARTFORD	6 12 64	90	10%	90%	-	-		2			1M	1	-
HAWAII														
MANAWAI DR CANAL	HICKMAN A F B	1 9 64	90	95%	5%	-	12,500		2			1M	1	-
ILLINOIS														
DUPAGE RIVER	PLAINFIELD	3 2 64	90	14%	86%	54%	5,000			3		15M	2	-
INDIANA														
BUCK CREEK	ACTON	7 24 64	90	15%	85%	-	4,000		2			8M	2	-
YELLOW RIVER	BREMEN	7 16 64	90	40%	60%	-	7,500		2			6M	2	-
SUGAR CREEK	CRAWFORDSVILLE	2 7 64	90	-	-	-	-				4	5M	1	-
KILLMORE CREEK	MICHIGANTOWN	5 26 64	90	50%	50%	-	375				4	6M	-	-
FAWN RIVER	SCOTT	6 23 64	90	20%	80%	-	270				4	-	-	-
IOWA														
WILDCAT CREEK	SHELLSBURG	9 8 64	90	30%	70%	-	5,000	1				5M	2	-
BIG SIOUX RIVER	SIOUX CITY	6 15 64	90	5%	95%	-	10,000		2			6M	2	-
KANSAS														
NORTONS BRANCH	HIAWATHA	5 23 64	90	1%	99%	60%	1,200			3		6M	2	-

Report of Fish Kills—Cause Unknown (Continued)

Cumulative Listing of Reports Received as of Date of Listing

RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL			OPERATIONS INDICATED AS RESPONSIBLE FOR KILL (SEE CODES BELOW)	TYPE OF FISH KILLED		PERCENT OF KILL WHICH WAS OF COMMERCIAL VALUE	ESTIMATED NUMBER OF FISH KILLED	SEVERITY				ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT	
		MONTH	DAY	YEAR		PERCENT GAME	PERCENT FORAGE			TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)		DA	MO
KENTUCKY																
OHIO RIVER	LOUISVILLE	10	-	64	90	5%	95%	65%	-		2			75M	-	-
MASSACHUSETTS																
NASHOBA BROOK	ACTON	6	11	64	90	60%	40%	-	350		2			-	-	-
CHARLES RIVER	BOSTON	6	11	64	90		100%	-	200,000		2			10M		
WALLUM LAKE	DOUGLAS	4	21	64	90	100%		-	200			3		50A	2	-
SARGENT POND	LEICESTER	6	5	64	90		100%	-	1,000		2			20A	2	-
RUFFUM POND	OXFORD	5	4	64	90		100%	-	260				4	20A	2	-
MICHIGAN																
SAGINAW RIVER	FSSEXVILLE	8	14	64	90		100%	-	2,000		2			1M	-	12
TAMARACK CREEK	HOWARD CITY	6	26	64	90	53%	47%	-	400			3		2M	-	2
SHIAWASSEE RIVER	OWOSSO	6	30	64	90	99%	1%	-	2,500		2			2M	-	5
MINNESOTA																
MINNESOTA RIVER	GRANITE FALLS	2	15	64	90		100%	-	30				4	-	-	-
MISSOURI																
MISSOURI RIVER	KANSAS CITY	5	24	64	90	-	-	-	280,000		2			130M	1	-
DITCH NO 10	KENNETT	6	8	64	90	40%	60%	-	1,000		2			3M	1	-
GASCONADE RIVER	MOUNT STERLING	5	6	64	90	1%	99%	5%	25,000			3		35M	2	-
MISSISSIPPI RIVER	SAINT LOUIS	1	27	64	90		100%	-	5,000			3		2M	1	-
NEBRASKA																
PLATTE RIVER	GOTHENBURG	6	23	64	90	12%	88%	-	-		2			6M	2	-
CITY LAKE 14TH ST	LINCOLN	11	17	64	90	50%	50%	-	200			3		2A	3	-
LOGAN CREEK	PENDER	5	5	64	90	60%	40%	-	700		2			10M	2	-
ROCK CREEK	SALEM	8	24	64	90	50%	50%	-	40				4	1M	1	-
NEMAHA RIVER	TABLE ROCK	5	-	64	90	-	-	-	-			3		-	1	-
NEW HAMPSHIRE																
MERRIMACK RIVER	NASHUA	7	29	64	90		100%	-	1,500				4	3M	-	4

RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL			OPERATIONS INDICATED AS RESPONSIBLE FOR KILL (SEE CODES BELOW)	TYPE OF FISH KILLED		PERCENT OF KILL WHICH WAS OF COMMERCIAL VALUE	ESTIMATED NUMBER OF FISH KILLED	SEVERITY				ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT	
		MONTH	DAY	YEAR		PERCENT GAME	PERCENT FORAGE			TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)		DA	HO
NEW JERSEY																
BLACKWOOD LAKE	BLACKWOOD	6	26	64	90	40%	60%	-	1,100		2			30A	3	-
ROCKY BROOK	HIGHTSTOWN	6	27	64	90	10%	90%	-	30				4	1M	2	-
RAMAPO RIVER	MAHWAH	10	5	64	90	2%	98%	-	1,018			3		1M	-	-
DELA & RARITN CAN	NEW BRUNSWICK	9	2	64	90	10%	90%	-	150			3		1M	7	-
LOPATCONG CREEK	PHILLIPSBURG	11	23	64	90	45%	55%	-	150		2			1M	1	-
WAWAYANDA CREEK	VERNON	7	16	64	90	100%		-	70				4	2M	1	-
CARNEGIE LAKE	PRINCETON	9	13	64	90	25%	75%	-	1,000		2			100A	-	-
PETERS BROOK	SOMERVILLE	9	18	64	90	25%	75%	-	15				4	-	-	-
NEW MEXICO																
PECOS RIVER	LOVING	4	25	64	90	80%	20%	-	-		2			2M	2	-
NEW YORK																
CATTARAUGUS CREEK	ARCADE	7	9	64	90	2%	98%	-	18,600		2			2M	1	-
VAN CORTLANDT LK	BRONX	6	4	64	90	1%	99%	-	5,000		2			-	-	-
CANISTEO	HORNELL	7	18	64	90		100%	-	750			3		-	-	-
SIX MILE CREEK	ITHACA	6	20	64	90	5%	95%	-	10,000	1				2M	-	-
NORTH CAROLINA																
HIGH ROCK RESERVR	KANNAPOLIS	9	19	64	90	1%	99%	1%	216,000				4	6A	-	-
NEUSE RIVER	KINSTON	5	21	64	90	20%	80%	10%	2,500			3		50M	1	-
HIGH ROCK RESERVR	SPENCER	9	17	64	90	1%	99%	-	1,175				4	2A	-	-
OHIO																
MARGARET CREEK	ATHENS	6	24	64	90	15%	85%	-	94			3		-	-	-
OLENTANGY RIVER	DELAWARE	4	9	64	90	2%	98%	-	200				4	2M	1	-
GRAND RIVER	FAIRPORT HARBOR	5	19	64	90	10%	90%	-	150				-	-	-	-
LAKE MILTON	MAHONING COUNTY	5	25	64	90	30%	70%	-	589				4	-	1	-
MILLERS FORK	PREBLE COUNTY	7	26	64	90	10%	90%	-	2,279				-	1M	-	-
GREAT MIAMI RIVER	SIDNEY	7	20	64	90	10%	90%	-	7,174				-	1M	-	-
MAUMEE RIVER	WATERVILLE	3	16	64	90	2%	98%	-	26,072			3		34M	-	-
JACKSON DITCH	WOOD COUNTY	6	13	64	90	-	-	-	5,349	1				3M	2	-
SHAWNEE CREEK	XENIA	7	25	64	90		100%	-	9,396		2			1M	-	-
PENNSYLVANIA																
SCHUYLKILL RIVER	CONSHOHOCKEN	8	-	64	90	40%	60%	-	4,000		2			4M	3	-
LAKE ERIE	ERIE	7	24	64	90	40%	60%	-	-		2			50A	3	-

Report of Fish Kills—Cause Unknown (Continued)

Cumulative Listing of Reports Received as of Date of Listing

RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL: MONTH	DAY	YEAR	OPERATIONS INDICATED AS RESPONSIBLE FOR KILL (SEE CODES BELOW)	TYPE OF FISH KILLED: PERCENT GAME	PERCENT FOREGN	PERCENT OF FISH KILLED OF COMMERCIAL VALUE	ESTIMATED NUMBER OF FISH KILLED	SEVERITY: TOTAL (1)	HEAVY (2)	MODERATE (3)	LIGHT (4)	ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT: (A)	(B)
PENNSYLVANIA (CONT)																
LAKE ERIE	ERIE	7	11	64	90	40%	60%	-	2,000				4	1M	2	-
BULL RUN	LEWISBURG	8	-	64	90	25%	75%	-	625			3		1M	3	-
TRIB E RR PERKMN	PERKASIE	7	1	64	90	30%	70%	-	200				4	1M	1	-
FRENCH CREEK	PHOENIXVILLE	8	24	64	90	40%	60%	-	350				4	1M	1	-
PINCHOT LAKE	ROSSVILLE	5	27	64	90	90%	10%	-	6,000		2			350A	7	-
SHENANGO RIVER	SHARON	7	10	64	90	75%	25%	-	500				4	1M	1	-
SHENANGO RIVER	SHARON	7	22	64	90	40%	60%	-	700			3		2M	2	12
PLUM CREEK	SHARPSBURG	7	23	64	90	40%	60%	-	2,000			3		3M	5	-
DELAWARE RIVER	UPPER BLK EDDY	5	31	64	90	50%	50%	-	-		2			10M	3	-
DELAWARE RIVER	YARDLEY	7	23	64	90	100%		-	2,000			3		3M	5	-
TENNESSEE																
BOONE LAKE	JOHNSON CITY	5	4	64	90	45%	55%	5	195				4	2A	2	-
RICHLAND CREEK	NASHVILLE	3	1	64	90	23%	77%	7%	524			3		2M	2	-
TEXAS																
BURNETT BAY	BAYTOWN	3	25	64	90		100%	-	200				4	-	5	-
SALADO CREEK	BELTON	8	9	64	90	75%	25%	-	-		2			-	-	-
ROLAND R-L WHITNY	CLEBURNE	1	26	64	90	20%	80%	-	-		2			15M	-	-
UNNAMED CREEK	DENTON	7	30	64	90	50%	50%	-	200			3		1M	2	-
TRINITY RIVER	FAIRFIELD	3	19	64	90		100%	-	-				4	-	-	-
N FK TAYLOR BAYOU	FANNETT	7	24	64	0	5%	95%	-	500		2			2M	-	-
BUFFALO SPRINGS L	LUBBOCK	4	9	64	90	10%	90%	-	-			3		340A	-	14
POND OFF SHIP CHL	LYNCHBURG	2	-	64	90		100%	-	45				4	-	-	-
TANKERSLEY CREEK	MT PLEASANT	6	10	64	90	50%	50%	-	-		2			5M	2	-
TRINITY RIVER	RIVERSIDE	3	17	64	90	60%	40%	40%	20,000		2			35M	4	-
NASWORTHY LAKE	SAN ANGELO	8	-	64	90		100%	-	2,000			3		-	1	-
GUADALUPE RIVER	SEGUIN	2	3	64	90	100%		-	-			3		-	-	-
BUFFALO LAKE	UMBARGER	6	14	64	90	10%	90%	-	-			3		50A	1	12
TIERRA BLANCA CRK	UMBARGER	6	14	64	90	10%	90%	-	-			3		15M	1	12
UTAH																
SURPLUS CANAL	SALT LAKE CITY	11	2	64	90		100%	-	2,500		2			1M	1	-
VIRGINIA																
DAN RIVER	DANVILLE	10	2	64	90		100%	-	100				4	1M	-	-
DAN RIVER	DANVILLE	4	17	64	90		100%	-	-			3		-	-	-
SHENANDOAH RIVER	FRONT ROYAL	9	14	64	90	-	-	-	200				4	-	-	-
JAMES RIVER	JAMESTOWN	5	9	64	90	98%	2%	98%	4,000,000		2			-	8	-
STAUNTON RIVER	LONG ISLAND	6	11	64	90		100%	-	200				4	-	-	-
JAMES RIVER	RICHMOND	5	28	64	90		100%	100%	10,000			3		5M	1	-
NANSEMOND RIVER	SUFFOLK	7	23	64	90		100%	100%	100,000			3		-	-	-
LITTLE CREEK	VIRGINIA BEACH	5	16	64	90	95%	5%	-	8,000		2			1M	-	-

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RIVER OR LAKE AFFECTED	NEAREST TOWN OR CITY	DATE OF KILL			OPERATIONS INDICATED AS RESPONSIBLE FOR KILL (SEE / THIS BELOW)	TYPE OF FISH KILLED		PERCENT OF KILL OF COMMERCIAL VALUE	ESTIMATED NUMBER OF FISH KILLED	SEVERITY				ESTIMATED MILES OR ACRES AFFECTED	DURATION OF CRITICAL EFFECT	
		MONTH	DAY	YEAR		PERCENT GAME	PERCENT FORAGE			TOTAL (A)	HEAVY (B)	MODERATE (M)	LIGHT (L)		H	M
WASHINGTON																
COAL CREEK SLOUGH	LONGVIEW	6	17	64	90	25%	75%	-	150			3		1M	-	-
TRIB TO LAKE WASH	SEATTLE	6	30	64	90	100%		-	60					1M	-	-
WEST VIRGINIA																
OHIO RIVER	STSTRSVILLE	1	9	64	90	20%	80%	-	-			3		27M	5	-
OHIO RIVER	WHEELING	1	2	64	90	-	-	-	-		2			-	-	-

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REV. 8-62

DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE

Form Approved
Budget Bureau No. 68-R706

(WASHINGTON USE)

REPORT OF POLLUTION-CAUSED FISH KILL

1. LOCATION:
Stream or Lake _____
Nearest Town _____ State _____

2. DATE OF KILL: _____

3. TYPE WATER:
☐ Fresh ☐ Salt ☐ Estuary

4. SOURCE OF POLLUTION

a. AGRICULTURAL OPERATIONS
- ☐ Poisons (Herbicides, pesticides, etc.)
- ☐ Fertilizers
- ☐ Manure drainage, ensilage liquors, or feed lot operations.

b. INDUSTRIAL OPERATIONS
- ☐ Mining
- ☐ Food & kindred products
- ☐ Paper & allied products.
- ☐ Chemicals
- ☐ Petroleum
- ☐ Metals
- ☐ Other (specify) _____

c. MUNICIPAL OPERATIONS
- ☐ Sewerage system
- ☐ Refuse disposal
- ☐ Water system
- ☐ Swimming pool

d. TRANSPORTATION OPERATIONS
- ☐ Rail ☐ Barge or boat
- ☐ Truck ☐ Pipeline

- ☐ e. OTHER _____
- ☐ f. UNKNOWN

(fold here)

g. SPECIFIC AGENT OR CAUSE, IF KNOWN: _____

5. TYPE OF FISH KILLED
- ____ % Game
- ____ % Non-game
- 100 % Total
- ____ % Commercial

6. ESTIMATED NUMBER KILLED _____

7. SEVERITY:
☐ Total ☐ Heavy ☐ Moderate ☐ Light

8. EXTENT: Miles of stream or acres of lake affected _____

9. DURATION OF CRITICAL EFFECT: ____ days ____ hrs.

REPORTING OFFICIAL

AGENCY MAILING ADDRESS

DATE

10. ADDITIONAL REMARKS: (State circumstances of kill; any visible effects of the pollution on water, or other details)

Figure 1.

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